

## SECTION 109

### RIPRAP AND SLOPE MATERIALS

#### 109.1 REQUIREMENTS

##### A. Riprap:

Stone for riprap shall be hard, angular, and durable and shall have a minimum weight of 155 pounds per cubic foot. Stone may either be quarried ledge rock or field stone. Stone shall be free from overburden, spoil, shale, and organic material and shall meet the following gradation requirements.

|           | <b>Size of Stone<br/>(lbs.)</b> | <b>% of Total Wt.</b> |
|-----------|---------------------------------|-----------------------|
| Class I   | 150 to 100                      | 15 to 25              |
|           | 100 to 50                       | 15 to 45              |
|           | 50 to 5                         | 15 to 55              |
|           | 5 to 0                          | 0 to 10               |
| Class II  | 500 to 300                      | 15 to 25              |
|           | 300 to 150                      | 15 to 45              |
|           | 150 to 15                       | 15 to 55              |
|           | 15 to 0                         | 0 to 15               |
| Class III | 1000 to 600                     | 15 to 25              |
|           | 600 to 300                      | 15 to 45              |
|           | 300 to 30                       | 15 to 55              |
|           | 30 to 0                         | 0 to 15               |
| Class IV  | 1400 to 1000                    | 15 to 25              |
|           | 1000 to 500                     | 15 to 55              |
|           | 500 to 50                       | 15 to 45              |
|           | 50 to 0                         | 0 to 15               |
| Class V   | 2000 to 1400                    | 15 to 25              |
|           | 1400 to 700                     | 15 to 45              |
|           | 700 to 70                       | 15 to 55              |
|           | 70 to 0                         | 0 to 20               |

Each load of riprap shall be well graded from the smallest to the maximum size specified. No more than five percent (5%) by weight shall pass a one-half (1/2) inch square opening sieve.

B. Filter Material:

Filter material shall consist of clean, hard, durable, open graded sand, gravel, or rock, crushed or uncrushed, meeting the following gradation requirements by dry weight:

|                               |           |
|-------------------------------|-----------|
| Passing a 3 inch sieve.....   | 100%      |
| Passing a 3/4 inch sieve..... | 70 to 95% |
| Passing a No. 4 sieve.....    | 40 to 75% |
| Passing a No. 200 sieve.....  | 0 to 8%   |

The P.I. of the filter material shall not exceed six (6).

The material shall be obtained from approved sources, which contain no organic matter or soft friable particles. Pit run local material will be acceptable if the specifications are met.

C. Testing:

|                       |        |
|-----------------------|--------|
| Plasticity Index..... | SD 207 |
| Specific Gravity..... | SD 210 |

**109.2 METHOD OF MEASUREMENT &  
109.3 BASIS OF PAYMENT**

Measurement and payment shall be in accordance with Sections 65 and 66 of these specifications.

**END OF SECTION**